What we claim is:

1. An ingress label switching router comprising:

a path table for designating an active path from among a plurality of paths through which packets of an equivalence class are
5   forwarded and for which priorities are set; and

a fault detector for operating the active path by referring to the path table and for setting, when detecting a recovery of a path higher in priority than the active path, the recovered path in the path table as an active path.

10 2. The ingress label switching router as claimed in claim 1 wherein when detecting a path recovery from a fault, the fault detector immediately sets the recovered path in the path table as an active path.

3. The ingress label switching router as claimed in claim 1 wherein
15 when detecting a path recovery from a fault, the fault detector confirms the path recovery by testing the recovered path, and then sets the recovered path in the path table as an active path.

4. The ingress label switching router as claimed in claim 1 wherein when a fault occurs in the active path after a path recovery from a
20 fault is detected, the fault detector sets the recovered path in the path table as an active path.

5. A relay label switching router comprising:

a path hop list for indicating a hop destination of a path through which a packet of an equivalence class is forwarded;
25   a message processor for registering the hop destination indicated in a received message in the path hop list and for forwarding the message to a next hop destination without deleting the hop destination; and

a fault detector for notifying an identifier of a path in which a
30 fault has recovered to an ingress label switching router based on the path hop list.

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6.   The relay label switching router as claimed in claim 5 wherein the fault detector notifies an identifier, detected by the fault detector itself or notified by a downstream label switching router, of a path in which a fault has recovered to an upstream label switching router

5   based on the path hop list.

7.   The relay label switching router as claimed in claim 5 wherein the message includes an address of an ingress label switching router as a hop destination, the message processor registers the address associated with the path in the path hop list, and the fault detector

10   directly notifies a path recovery from a fault to the ingress label switching router.

8.   The relay label switching router as claimed in claim 5 wherein the message comprises a label request message.

9.   An egress label switching router comprising:

15   a path hop list for indicating a hop destination of a path through which a packet of an equivalence class is forwarded;

        a message processor for registering the hop destination indicated in a received message in the path hop list; and

        a fault detector for notifying an identifier of a path in which a

20   fault has recovered to an ingress label switching router based on the path hop list.

10.   The egress label switching router as claimed in claim 9 wherein the fault detector notifies an identifier, detected by the fault detector itself, of a path in which a fault has recovered to an upstream label

25   switching router based on the path hop list.

11.   The egress label switching router as claimed in claim 9 wherein the message includes an address of an ingress label switching router as a hop destination, the message processor registers the address associated with the path in the path hop list, and the fault detector

30   directly notifies a path recovery from a fault to the ingress label switching router.

12.   The egress label switching router as claimed in claim 9 wherein the message comprises a label request message.

13.   A path switchover control method of an ingress label switching router comprising:

5   a first step of designating an active path from among a plurality of paths through which packets of an equivalence class are forwarded and for which priorities are set; and

a second step of operating the active path by referring to the path table and for setting, when detecting a recovery of a path higher

10   in priority than the active path, the recovered path in the path table as an active path.

14.   The path switchover control method of the ingress label switching router as claimed in claim 13 wherein when a path recovery from a fault is detected, the second step immediately sets the

15   recovered path in the path table as an active path.

15.   The path switchover control method of the ingress label switching router as claimed in claim 13 wherein when a path recovery from a fault is detected, the second step confirms the path recovery by testing the recovered path, and then sets the recovered path in the

20   path table as an active path.

16.   The path switchover control method of the ingress label switching router as claimed in claim 13 wherein when a fault occurs in the active path after a path recovery from a fault is detected, the second step sets the recovered path in the path table as an active

25   path.

17.   A path switchover control method of a relay label switching router comprising:

a first step of registering in a path hop list a hop destination indicated in a received message of a path, through which a packet of

30   an equivalence class is forwarded;

a second step of forwarding the message to a next hop

32

destination without deleting the hop destination; and

a third step of notifying an identifier of a path in which a fault has recovered to an ingress label switching router based on the path hop list.

18. The path switchover control method of the relay label switching router as claimed in claim 17 wherein the third step notifies an identifier, detected by its own relay label switching router or notified by a downstream label switching router, of a path in which a fault has recovered to an upstream label switching router based on the path hop list.

19. The path switchover control method of the relay label switching router as claimed in claim 17 wherein the message includes an address of an ingress label switching router as the hop destination,

the first step registers the address associated with the path in the path hop list, and

the third step directly notifies an identifier of a path in which a fault has recovered to the ingress label switching router.

20. The path switchover control method of the relay label switching router as claimed in claim 17 wherein the message comprises a label request message.

21. A path switchover control method of an egress label switching router comprising:

a first step of registering in a path hop list a hop destination indicated in a received message of a path, through which a packet of an equivalence class is forwarded; and

a second step of notifying an identifier of a path in which a fault has recovered to an ingress label switching router based on the path hop list.

22. The path switchover control method of the egress label switching router as claimed in claim 21 wherein the second step notifies an identifier, detected by its own egress label switching router, of a path

in which a fault has recovered to an upstream label switching router based on the path hop list.

23. The path switchover control method of the egress label switching router as claimed in claim 21 wherein the message includes an address of an ingress label switching router as a hop destination, the first step registers the address associated with the path in the path hop list, and the second step directly notifies a path recovery from a fault to the ingress label switching router.

24. The path switchover control method of the egress label switching router as claimed in claim 21 wherein the message comprises a label request message.